

WHAT IS CLAIMED IS:

1. A manually operated rotatable impact tool comprising:
  - a driven member having means for retaining and driving a fastener about an axis, the driven member further having at least one impact stop offset from the axis;
  - a driving member rotatably connected to the driven member for driving the driven member about the axis to loosen or tighten the fastener;
  - an impact mass movable along a path in communication with the impact stop;
  - a spring disposed in the path for storing energy upon rotation of the driving member; and
  - energy releasing means for releasing the stored energy and allowing it to be at least partially transferred to the impact mass such that the impact mass accelerates and strikes the impact stop upon the release of the stored energy.
2. The impact tool of claim 1, wherein the fastener is a hexagonal nut and the means for retaining and driving the hexagonal nut comprises a mating hexagonal recess for containing the hexagonal nut therein.
3. The impact tool of claim 2, wherein the driven member is cylindrical and the driving member has a mating cylindrical recess for containing the driven member therein.
4. The impact tool of claim 3, wherein the driving member further has a lever for applying a torque to the driven member and hexagonal nut contained therein.
5. The impact tool of claim 1, further comprising an abutment on the driving member, wherein the spring is a compression spring disposed in the path between the abutment and the impact mass.
6. The impact tool of claim 1, further comprising adjustment means for varying a predetermined angular rotation of the impact mass and thereby the amount of energy stored in the impact mass at the time of releasing the impact mass to strike the impact stop.
7. The impact tool of claim 1, wherein rotation of the driving member in a first angular direction loosens the fastener.
8. The impact tool of claim 1, wherein rotation of the driving member in a first angular direction tightens the fastener.
9. The impact tool of claim 1, wherein rotation of the driving member in a first angular

direction loosens the fastener and rotation of the driving member in a second angular direction opposite the first angular direction tightens the fastener.

10. The impact tool of claim 1, wherein the impact mass strikes the impact stop upon the rotation of the driving member in a first angular direction and the impact mass strikes the impact stop subsequently by rotation of the driving member in a direction opposite the first angular direction followed by rotation of the driving member in the first angular direction.

11. The impact tool of claim 1, wherein the impact mass strikes the impact stop upon the rotation of the driving member in a first angular direction and the impact mass strikes the impact stop subsequently by continued rotation of the driving member in the first angular direction.

12. A manually operated rotatable impact tool comprising:  
a driven member having means for retaining and driving a fastener about an axis, the driven member further having at least one anvil surface offset from the axis;  
a driving member rotatably connected to the driven member for driving the driven member about the axis to loosen or tighten the fastener, the driving member having at least one anvil in cooperation with the at least one anvil surface;  
biasing means for biasing the at least one anvil surface and at least one anvil together;  
at least one cam for engaging a surface of the driving member and for moving the at least one anvil apart from the corresponding at least one anvil surface upon rotation of the cam and for releasing the driving member such that the spring pulls the at least one anvil to impact the corresponding at least one anvil surface to create a torque around the axis.

13. The manually operated rotatable impact tool of claim 12, wherein the cam has two or more cam surfaces each of which engages the surface of the driving member.

14. The manually operated rotatable impact tool of claim 12, wherein the at least one cam is rotatably disposed in the driven member

15. The manually operated rotatable impact tool of claim 14, wherein the at least one cam comprises two cams, each rotatably disposed in the driven member and equally distanced from the axis.

16. A manually operated rotatable impact tool comprising:  
a driven member having means for retaining and driving a fastener about an axis, the

driven member further having at least one anvil offset from the axis, the anvil being rotatably disposed in the driven member into and out from a path;

    a driving member rotatably connected to the driven member for driving the driven member about the axis to loosen or tighten the fastener;

    an impact mass movable along the path in communication with the at least one anvil;

    a flexible member connecting the driving member and impact mass for storing energy upon rotation of the driving member; and

    energy releasing means for releasing the stored energy and allowing it to be at least partially transferred to the impact mass such that the impact mass accelerates and strikes the at least one anvil upon the release of the stored energy while the at least one anvil is rotated into the path.

17. The manually operated rotatable impact tool of claim 16, wherein the at least one anvil comprises first and second anvils, each of the first and second anvils being rotatably disposed in the driven member into and out from the path, the impact mass being held against the first anvil upon rotation of the driving member due to a biasing force exerted by the flexible member, wherein the energy releasing means comprises a follower plate rotatably disposed in the driven member, the follower plate having at least one arm for engaging the first anvil and rotating the first anvil out from the path causing the impact mass to rotate and impact the second anvil.

18. The manually operated rotatable impact tool of claim 17, wherein the follower plate further has at least one leg which when rotated does not interfere with the first and second anvils and further comprising a spring connecting the leg to the impact mass for biasing the impact mass toward one of the first or second anvils.

19. The manually operated rotatable impact tool of claim 16, wherein the driven member comprises a shell having a wall, the at least one anvil being rotatably disposed in the wall.

20. The manually operated rotatable impact tool of claim 16, further comprising a biasing means for biasing the at least one anvil into the path.